

11. The council of the central bureau will meet once every quarter on a fixed day. It may hold extraordinary meetings at the instance of the minister. The council gives its advice in the budget proposed by the director, on the construction of buildings or instruments intended for regional meteorological observations, on the collective investigations carried on in the various establishments, on the nominations and promotions of the officials, &c.

12. The president, vice-president, and the secretary of the council are appointed annually by the minister on the proposal of the council.

13. The council holds a general meeting yearly at which may be present the heads of the central bureau and of the regional observatories, the delegates of the regional and departmental commissions, and three delegates of the French Meteorological Society.

A regulation deliberated in council and approved by the minister will determine the mode and number of the delegations.

This meeting will hear the report of the president and council on the work of the year, and, if there are any, the reports and memoirs of the heads of the observatories that receive subventions, and those of the delegates of the regional or departmental commissions. It will discuss the views submitted to it, and transmit them to the minister. The report of the president will be printed.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

A TOWN meeting was held at Liverpool on Friday, the Mayor presiding, with the view of establishing a college for higher education, so as to qualify for degrees in art, science, and other subjects at any of the universities.

LEYDEN.—The university shows an attendance at present of 823 students, divided among the faculties as follows:—Law, 487; theology, 41; medicine, 184; philology, 58; science, 53. The corps of professors numbers 47.

AGRAM.—This young university is attended at present by 348 students, of whom but four are from countries outside Austria.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 16.—“Experimental Researches on the Electric Discharge with the Chloride of Silver Battery. Part II. The Discharge in Exhausted Tubes.” By Warren De La Rue, M.A., D.C.L., F.R.S., and Hugo W. Müller, Ph.D., F.R.S.

“Note on Legendre's Coefficients.” By I. Todhunter, F.R.S.

May 23.—“Observations on Arctic Sea-water and Ice.” By Dr. Moss.—The paper consists of physical and chemical observations made during the Expedition of 1875-76 on polar ice and sea-water, and is accompanied by a tabulated statement of chlorine and specific gravity estimations; the latter made by the method devised by Mr. Buchanan of the *Challenger*. The author remarks that the low specific gravity of the Polar Sea (1.02467) indicates that even the deepest samples obtained had already received the dilution characteristic of outflowing polar currents. This low specific gravity was maintained through the winter. The highest temperature observed in the deep stratum of dense warm water in Smith's Sound was below 32°, but since its specific gravity was above that of Atlantic water, the northward flowing current may have a slightly higher temperature at a greater depth. The disturbed proportion of sulphates to chlorides in polar waters is attributed to the littoral source of their dilution and to the difference in the behaviour of the sulphuric and chloric cryohydrates (rather than to absence of fucoidal plants or volcanic influence, as suggested by Forchhammer). A detailed description is given of a *névé*-like stratification in the polar ice, proving, in the author's opinion, that the stupendous floes met with by the recent, and many other expeditions, are due, not to progressive freezings of sea-water, or to the sliding up of thinner ice-fields, but to a perennial accumulation of polar precipitation. The stratification includes

and overlies air-carried *débris* of crystalline rocks, chiefly quartz, augite, and magnetite.

The strata are often built upon a conglomerate formation (including salt-water Diatomaceæ) affording evidence of a lateral extension of the floating glacier (by the freezing together of fragments in fissures). The “blue-domed” floes belong to the outer zones of the polar ice-cap, where waste exceeds precipitation. Their undulating surfaces intersecting the horizontal stratification and pitted with the ice-dust left from the layers above, are the surface signs of the decay which finally restores polar precipitation to the ocean in the shape of the increased dilution of outflowing polar currents.

May 25.—“On the Equations of Circles.” (Second Memoir.) By John Casey, LL.D., F.R.S., M.R.I.A., Professor of Mathematics in the Catholic University of Ireland.

“Contributions to the Anatomy of the Central Nervous System in Vertebrate Animals. Part I. Ichthyopsida. Section I. Pisces. Subsection 1. Teleostei.” By Alfred Sanders, M.R.C.S. Communicated by Prof. Huxley, Sec.R.S.

Zoological Society, May 7.—F. D. Godman, F.Z.S., in the chair.—Mr. T. J. Parker read some notes on the stridulating organ of *Palinurus vulgaris* which had first been described by Dr. K. Möbius, but on whose observations Mr. Parker offered several criticisms.—A communication was read from Dr. F. Buchanan White, entitled “Contributions to a Knowledge of the Hemipterous Fauna of St. Helena, and Speculations on its Origin.” In the first part of his paper the author, after briefly noticing what was known with regard to the fauna and flora of that remote and interesting oceanic island, and mentioning the various theories that had been brought forward to account for their origin, discussed the difficulties of the animals, and argued that they had evidently been derived at a remote period from the Palaearctic region by way of Madeira, the Canaries, and the Cape de Verde Archipelago. In the second part of his communication Dr. F. B. White described the Hemiptera collected in St. Helena by the late Mr. T. V. Wollaston, during the recent visit of that lamented naturalist to the island. The collection included thirty species, of which five were probably introduced; one appeared to be indigenous, but seemed identical with a European species, and the remaining twenty-four were regarded by the author as new and peculiar to the island. Seven new genera and one new sub-genus were created for the reception of ten of the species, the rest, with one exception, being referred to European genera. Specimens and drawings of details were exhibited in illustration of the paper.—Mr. P. L. Sclater, F.R.S., read some further remarks on *Fuligula natiomi*, a species of duck from Western Peru, of which he had lately received a nearly adult male from Prof. Nation, the discoverer of the species.—Mr. A. G. Butler, F.Z.S., read the descriptions of a small collection of lepidoptera made at Kingston, Jamaica, by Mr. James J. Bowry.—Mr. Edgar A. Smith, F.Z.S., read a paper containing the description of three new land shells from Jamaica and Borneo.—A communication was read from Mr. D. G. Elliot, F.Z.S., containing a memoir on the fruit pigeons of the genus *Philopus*. Mr. Elliot recognised seventy-one species of this genus.

Meteorological Society, May 17.—Mr. C. Greaves, F.G.S., president, in the chair.—A. H. J. Crespi, B.A., M.R.C.S., Rev. David Lamplugh, William Morris, M. Inst. C.E., James Muir, M. Inst. C.E., and Miss E. A. Dymond, were elected Fellows of the Society.—The following papers were read:—On the daily inequality of the barometer, by W. Rundell, F.M.S.—Meteorology of Mozufferpore, Tirhoot, for the year 1877, by C. N. Pearson, F.M.S.—Note on the great rainfall of April 10-11, as recorded at the Royal Observatory, Greenwich, by William Ellis, F.R.A.S.—Observations of Sea Temperature at slight depths, by Capt. W. F. Caborne, F.M.S.

Anthropological Institute, April 30th.—Major-General A. Lane Fox, F.R.S., vice-president, in the chair.—Mr. Francis Galton, F.R.S., read a paper on composite portraits, made by combining those of various persons into a single resultant figure (*NATURE*, p. 97).—The Director read a paper by Mr. C. Staniland Wake on the origin of the classificatory system of relationships used among primitive people. After criticising Mr. Morgan's explanation of the classificatory system as having originated in the practice of marriage among consanguine, Mr. Wake proceeded to show that the social condition of the Polynesian peoples, who possessed the simplest form of that system was inconsistent with the origin assigned to it by Mr. Morgan. The

author of the paper then showed, by an examination of various phases of the classificatory system, especially the Australian, that, although kinship may for certain purposes have been originally traced through the mother, the regulations as to marriage were based also on the relationship of a father to his child, and that the ideas which gave rise to those regulations also originated the classificatory system.—Mr. A. L. Lewis described a rude stone monument, known as the "Devil's Arrows," near Boroughbridge, Yorkshire.

Geologists' Association, May 3.—Prof. J. Morris, F.G.S., president, in the chair.—On the coralline oolites, &c., of Yorkshire, by W. H. Hudleston, M.A., F.G.S. The beds between the Kimmeridge clay and L.C.G. may be summarised as follows:—

		Feet.
Supracoralline	Upper Calcareous Grit: "Throst-ler," Cement Stone, &c. ...	6-36
Zone of <i>A. plicatilis</i> ...	Coral Rag: Subzone of <i>Cidaris florigemma</i> ...	8-40
Upper part of zone of <i>A. perarmatus</i> ..	Coralline, Oolite and Middle Grit. Lower Limestones, including Lower Coral Rag, Passage-beds, &c. ...	30-80 20-120

The great mass of limestone in the zone of *A. perarmatus* is an exceptional feature as regards England: fauna Oxfordian, especially towards the base, but the highest shell-bed in some places may be classed with the succeeding zone. The middle grit, a sandbank of variable thickness, developed in the Tabular range, and passing upwards through a series of shelly sub-oolitic grits (*e.g.* Pickering *Trigonia*-beds) into the coralline oolite, the whole constituting the lower subdivision of the zone of *A. plicatilis*; absence of Brachiopoda. The topographical sections described, and the Howardian oolites compared with those of the Tabular range: lithology of the group.—The coral rag sometimes sharply separated from underlying oolites; sometimes, though more rarely, blended by coralliferous oolites, coral shell-beds, &c. Ammonites rare, but where found in the intercoralline pastes, a peculiar form of *A. plicatilis* (? *A. varicosatus*, Buckl.) prevails. Topographical sections described, and the strong contrast between the coralline oolite of Pickering and the coral rag of North Grimston pointed out. Observations on the silicification of the Rag, and the frequent formation of flints; presumed connection in certain cases, with abundance of sponge spicules, especially "globo-stellates." The supracoralline beds principally argillaceous limestones, and sandy shales, with a capping of upper calcareous grit; numerous ammonites of a lower Kimmeridge type, but other fossils few and badly preserved. A slight sketch of the stratigraphy of the region surrounding the Vale of Pickering, and a brief notice of the paleontology of the entire corallian series in Yorkshire, explanatory of the table of fossils, concluded the paper.

Institution of Civil Engineers, May 21.—Mr. W. H. Barlow, F.R.S., vice-president, in the chair.—The paper read was on the design generally of iron bridges of very large spans for railway traffic, by Mr. T. C. Clarke, M.Inst.C.E., of Philadelphia.

PARIS

Academy of Sciences, May 20.—M. Fizeau in the chair.—The following among other papers were read:—On the temperature of the air at the surface of the ground and in the ground to 36 m. depth, also the comparative temperature of turf-covered and bare ground, during 1877, by MM. Becquerel. The temperature was a little higher on an average in the turf-covered than in the bare ground, and in the former it never sank below zero. In the latter, at 0.05 m., it only once sank below the temperature of melting ice.—On the action of the nervous system on the sudoriferous glands, by M. Vulpian. These glands seem (like the salivary glands) to be subject to two antagonistic influences exerted by different nerve-fibres; the one class, which conduct the exciting influence, nearly all come directly from the bulbo-medullary centres; the other class, which conduct the moderating influence, also emanate from these centres, but indirectly, through the great sympathetic.—A letter from Prof. Hughes stated that by inserting an induction-coil in the circuit, in his arrangement, the Bell telephone could be heard over a large hall. His system was a very sensitive thermoscope, &c.—Application of the telephone on board the cruiser *La Desaix*, by M. Tréve. This ship communicated very successfully with another in tow

by means of the telephone, the circuit being completed by the sea and copper sheathing. Another application was, fitting a telephone to the head of divers' apparatus.—On alloys of gallium and aluminium, by M. Lecoq de Boisbaudran. One such alloy (containing a good deal of aluminium) is solid but brittle; it decomposes water, with rise of temperature, liberation of hydrogen, and formation of a brown powder, later resolved into white flocks of alumina; nearly all the gallium is liberated in the form of globules. Liquid or pasty alloys may also be formed, with much greater decomposing power.—Production of liquid and gaseous carbonised hydrogens by the action of pure water on a carburetted alloy of iron and manganese, by M. Cloez. Water alone, acting with heat on such an alloy, yields its oxygen to the metal, forming, first, protoxides, which afterwards, by action of air, pass to a higher degree of oxidation. A part of the hydrogen enters into the free state; the rest combines with the carbon to produce hydrocarbons similar to petroleum.—On an induction machine, by M. Gaiffe. To obtain a current as constant as possible he employs a bobbin of elliptical section instead of circular (Siemens); the change of polarity is thus effected gradually during the whole of a half-revolution.—On an allotropic modification of copper, by M. Schützenberger. This is got by electrolysis of a solution of about 10 per cent. of acetate of copper (previously boiled), with two Bunsen or three Daniell elements, the negative platinum plate being placed parallel to the larger positive copper electrode, and 3 to 4 ctm. from it. The allotropic copper is then deposited on the platinum, as brittle, rugous metallic plates, of bronze aspect. The specific gravity is 8.0 to 8.2; that of ordinary copper is 6.9. The moist plates quickly oxidise at the surface in air. Allotropic copper is changed to ordinary copper by heat, and prolonged contact with dilute sulphuric acid.—On a new synthetic method of formation of carbides of hydrogen, by M. Randolph. This is by causing a substance like fluoborethylene to act on oxygenated organic compounds capable of furnishing given carbides by dehydration.—On pelletierine, an alkaloid from the bark of the pomegranate tree, by M. Tanret. This volatile alkaloid is thought to explain the ténifuge properties of pomegranate bark in the fresh state.—On the distinction between luminous and chromatic sensations, by M. Charpentier. The luminous sensibility may change under certain conditions (rest in darkness and exposure to bright rays), while the sensibility to colours remains constant.—On the existence of reflex trembling, in the unparalysed member, in certain hemiplegic subjects, by M. Dejerine. This may be produced, *e.g.*, by flexion of the foot on the leg.—On the terminations of nerves in the sudoriparous glands of the cat's paw, by M. Coyne. The glandular *cul-de-sac* is brought into relation with the peripheric nerve system (1) by nerve tubes losing themselves in the limiting membrane; (2) by cells similar to multipolar nerve-cells situated outside the limiting membrane.—On the unity of forces in geology, by M. Hermite.

CONTENTS

	PAGE
BALFOUR ON ELASMOBRANCH FISHES. By Prof. E. RAY LANKESTER, F.R.S.	113
OUR BOOK SHELF:—	
Streeter's "Gold"	115
LETTERS TO THE EDITOR:—	
Alternate and Stereoscopic Vision.—W. M. FLINDERS PETRIE.	115
Inside Out.—C. J. MONRO	116
Physical Science for Artists.—ROBERT J. LECKY	116
Dr. P. P. Carpenter's Collection.—Principal J. W. DAWSON, F.R.S.	116
Menziesia Cærulea.—G. C. DRUCE	116
Landralls.—CHARLES DIXON !	116
Hereditary Transmission.—GEORGE S. WATSON	116
THE PHONOGRAPH AND ITS FUTURE	116
SIR G. NARES' ACCOUNT OF THE ENGLISH ARCTIC EXPEDITION (<i>With Illustrations</i>)	118
TRANSPLANTATION OF SHELLS. By Dr. CHARLES DARWIN, F.R.S. (<i>With Illustration</i>)	120
THE NATIONAL WATER SUPPLY	121
PHYSICAL SCIENCE FOR ARTISTS, IV. By J. NORMAN LOCKYER, F.R.S. (<i>With Illustrations</i>)	122
COSMIC METEOROLOGY. By JOHN ALLAN BROWN, F.R.S.	126
THE MICROPHONE. By Dr. C. WILLIAM SIEMENS, F.R.S.; GEO. M. SEABROKE; F. J. M. PAGE	129
EARTHQUAKE IN VENEZUELA. By Dr. A. ERNST	130
OUR ASTRONOMICAL COLUMN:—	
Tempel's Comet, 1873, II.	131
The Recent Transit of Mercury	131
Encke's Comet	131
GEOGRAPHICAL NOTES	131
NOTES	132
THE FRENCH METEOROLOGICAL SERVICE	134
UNIVERSITY AND EDUCATIONAL INTELLIGENCE	135
SOCIETIES AND ACADEMIES	135